

Interactive comment on “Mercury emission and speciation of coal-fired power plants in China” by S. Wang et al.

S. Wang et al.

wangshuxiao@tsinghua.org.cn

Received and published: 24 December 2009

Reply to interactive comment on “Mercury emission and speciation of coal-fired power plants in China” by S. Wang et al.

Reply to comments from Referee #1: (1) P 24052 line 6 and 24055 line 17, the preferred name in English is Selective Catalytic Reduction. The manuscript was revised accordingly. (2) P 24053 line 20: physico-chemical. The word was revised accordingly. (3) P24053 line 21: the subject of this sentence must be China, not Hg emissions in China. How about, As the largest coal producer and consumer in the world, China releases amounts of Hg that have been . . . P 24053 line 22: attention not attentions. The sentence was revised to “As the largest coal producer and consumer in the world, China releases amounts of Hg that have been increasing rapidly in recent years and

C9012

are getting more and more attention (Wu et al., 2006; Pirrone et al., 2009).” (4) P 24053 line 24: at an annual. . . The manuscript was revised accordingly. (5) P 24053 line 27: indicating an even. . . The manuscript was revised accordingly. (6) P 24053 line 29: stations are only. . . The manuscript was revised accordingly. (7) P 24054 lines 1-2: Are there no tests in western Europe? It’s hard to believe. A citation is needed. One citation of an onsite test in Netherlands was added. Meij, R. and Winkel, H.: Mercury emissions from coal-fired power stations: The current state of the art in the Netherlands, *Sci. Total Environ.*, 368(1), 393-396, 2006. (8) P 24054 line 2: paucity of information on The sentence was revised accordingly. (9) P 24054 line 5: Streets et al 2005 is not in the reference list. The missed literature has been added to the reference list. Streets, D.G., Hao, J., Wu, Y., Jiang, J., Chan, M., Tian, H., and Feng, X.: Anthropogenic mercury emissions in China, *Atmos. Environ.*, 40(39), 7789–7806, 2005. (10) P 24054 line 13: removal efficiency of. . . The sentence was revised accordingly. (11) P 24054 line 15: The tests also indicated that the share. . . The sentence was revised accordingly. (12) P 24054 line 16: separate “boilersis” The sentence was revised accordingly. (13) P 24055 line 6: mass balance was estimated from the gathered. . . The sentence was revised accordingly. (14) P 24055 line 13: units, not unites. The sentence was revised accordingly. (15) P 24055 line 20: power plants are shown. . . The sentence was revised accordingly. (16) P 24057 line 8: plants are located in. . . The sentence was revised accordingly. (17) P 24057 line 8: Is it possible to give the names of the provinces in which the plants are located so that they can be linked with the coal types and Hg contents? The names of the provinces in which the plants are located have been added in Table 1. (18) P 24057 line 9: coal not coals. The word was revised accordingly. (19) P 24057 Sec 3.1: Because the range of Hg content is so wide, some broader discussion of the relevance of the results across coals of vastly different type is needed. Should emission factors be given as a function of Hg content, for example? The relevance of the results across coals were somewhat discussed in Section 3.2 and 3.3. Fig.3 in Sec. 3.2 showed the relationship between mercury release and Hg contents in coal. Fig.8 and Fig.9 in Sec. 3.3 showed the relationship between

C9013

Hg removal efficiency and coal type/quality. However, because Hg content in coal is not the only factor that affect Hg emission factor, with the currently available data, we cannot derive the quantitative relationship between Hg emission factors and Hg content in coal. More tests are necessary to calculate such function. (20) P 24058 line 3: varies over a large range. . . The sentence was revised accordingly. (21) P 24058 line 13: temperature decreases. . . The word was revised accordingly. (22) P 24058 line 17: By contrast or In contrast. . . The word was revised to "By contrast". (23) P 24058 line 28: oxidized form in the presence of halogens (Cl and Br). The sentence was revised accordingly. (24) P 24059 lines 11-17: This discussion of elementary chemistry can be omitted. This discussion of elementary chemistry was deleted according to reviewer's comments. (25) P 24059 line 17: to be more efficient. The sentence was revised accordingly. (26) P 24060 line 5: For a certain amount of absorbent. . . The sentence was revised accordingly. (27) P 24060 line 12: in the adsorption process. The sentence was revised accordingly. (28) P 24060 lines 17-20: Again this description is too elementary and can be omitted. This part and Fig. 6 was deleted as the reviewer suggested. (29) P 24062 Sec3.3: Why isn't quantitative information given for the SCR process? The influence of SCR on mercury transformation was discussed. However, since there is only one tested power plant is with SCR process, it is difficult to quantitatively evaluate the influence of SCR. In future, more tests will be conducted on the power plants with SCR. (30) References: Wu et al 2009 can cite complete ACPD reference. The reference of Wu et al. (2009) was updated. Wu, Y., Streets, D. G., Wang, S., and Hao, J.: Uncertainties in estimating mercury emissions from coal-fired power plants in China, *Atmos. Chem. Phys. Discuss.*, 9, 23565-23588, 2009.

Reply to comments from Referee #2: Some description of the locations, and if possible point to major differences for different parts of the country (if e.g. related to different coal types/qualities), would be useful information. The locations of the tested plants were added in Table 1.

Please also note the supplement to this comment:

C9014

<http://www.atmos-chem-phys-discuss.net/9/C9012/2009/acpd-9-C9012-2009-supplement.pdf>

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 9, 24051, 2009.